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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/599,027	06/22/2000	Nagayoshi Ichikawa	016887/0999	8692

7590

07/12/2002

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EXAMINER

PALABRICA, RICARDO J

ART UNIT

PAPER NUMBER

3641

DATE MAILED: 07/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

SK

Office Action Summary	Application No. 09/599,027	Applicant(s) ICHIKAWA ET AL.	
	Examiner Rick Palabrica	Art Unit 3641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 12-26 is/are pending in the application.
- 4a) Of the above claim(s) 1-9, 16, 19-22 and 26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10, 12-15, 17, 18 and 23-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's amendment in Paper No. 10, dated 5/14/02, which traversed the claim rejections in Office Action, dated 1/14/02, is acknowledged. This amendment cancelled claim 11 and amended claim 10.

Response to Arguments

2. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., application of both a photocatalytic substance and a noble metal on a surface of a reactor structural member) are not recited in the rejected claim(s). Note that both the old claim 11 (which has now been combined with the old claim 10) and the amended claim 10, refer to the corrosion potential reducing substance as being formed "as a particle **having** a surface on which at least one of Pt, Rh, Ru and Pd is provided." This claim language clearly states that the noble metal (e.g., Pt) is formed on a surface surrounding a particle of the photocatalytic substance. Contrary to the allegation of the applicant in said amendment, the claim language does **not** state that the noble metal is applied on a surface of the reactor structural member.

3. As to the status of claim 16, the applicant clearly indicated in his reply to the election requirement (Paper No. 7, dated 12/26/01) that among the claims that pertain to the elected invention (i.e., claims 10-25), the claims that read on the elected species are claims 10 to 15 and 17 to 25. Note the absence of claim 16 in applicant's reply. Claim 16 was therefore excluded from examination in the previous Office Action because the examiner agreed with applicant's proper determination that claim 16 pertains to non-elected species for depositing the corrosion potential reducing substance on the surface of the reactor structural member. Also, as stated in the previous Office Action, claims 19-22 are directed to a non-elected species and therefore were also not considered for examination.

Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 10, 13 -15, 17,18, and 25 are rejected under 35 U.S.C. 102(b) as being unpatentable over either one of Hettiarachchi et al. (U.S. 5,602,888) or Kim et al. (U.S. 5,793,830).

Hettiarachchi et al. disclose a method for protecting against stress corrosion cracking in a water-cooled reactor by injection into the reactor water of a noble metal, such as platinum or palladium, in conjunction with hydrogen, to reduce the electrochemical corrosion potential at the surface of reactor components (see column 7, last paragraph and column 8, line 1-3). Reactor materials susceptible to said stress corrosion include carbon steel, alloy steel, stainless steel, **nickel-based**, cobalt-based, and zirconium-based alloys (see column 1, lines 37-40. The noble metal (i.e., platinum or palladium) compound decomposes under reactor thermal and radiation conditions to release ions/atoms of the noble metal that incorporate in or deposit on the oxide film formed on stainless steel and other alloy components. Note that this oxide film is believed to include mixed nickel, iron and chromium oxides (see column 4, lines 32+). Thus, a noble metal (i.e., Pt or Pd) is formed on the surface of a photocatalytic substance (i.e., iron oxide). Said oxide film can have a 1-2 micron thickness (see page 6, lines 19+).

Kim et al. disclose a method for mitigating stress corrosion cracking in a Fe-base, Ni-base or Co-base metal alloy component of a water-cooled reactor by formation of an insulating layer as coating on the surface of the alloy. They disclose in Fig. 9E an embodiment of said insulating layer being formed by ZrO₂ doped with a noble metal (see column 8, lines 24+). This metal coating self-passivate by forming an oxide in high temperature water, or it may also be applied by thermal spraying (e.g., see column 9, lines 36+). Note that some ZrO₂ – noble metal combination will inherently have the

noble metal on the surface of the photo catalytic ZrO_2 . The coating can be in the order of 1 micron (see column 12, lines 24+). Kim et al. further disclose that their method also includes adding hydrogen to the feedwater of the nuclear reactor during reactor operation (see claim 13).

5. Claims 10, 13, 14, 15, 18, and 25 are rejected under 35 U.S.C. 102(b) as being unpatentable over either one of Andresen et al. (U.S. 5,608,766) [hereinafter referred to as Andresen-1], or Andresen et al. (U.S. 5,768,766) [hereinafter referred to as Andresen-2].

Either one of Andresen-1 or Andresen-2 disclose a method to mitigate stress corrosion cracking in a water-cooled reactor by doping stainless steel surfaces with a noble metal (e.g., palladium) in-situ into the high-temperature water of the reactor (see column 6, last paragraph). The noble metal can be injected in conjunction with injection of small amounts of hydrogen (see column 9, top paragraph). The method optionally includes the step of removing some or all of the oxide film on the surface of the reactor component in situ and then co-depositing metal, e.g., palladium during subsequent growth of the oxide film. The result is a metal-doped oxide film having a relatively longer catalytic life in the reactor operating environment (see column 5, 2nd to last paragraph). Note that the oxide film contains iron (see column 7, 1st full paragraph). Since not all of the oxide film is removed, prior to the noble metal injection, some of the photocatalytic

photocatalytic iron oxide atoms on the surface of the reactor structural material will inherently be coated with noble metal atoms, as a result of the noble metal injection.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 12, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Hettiarachchi et al. or Kim et al. as applied to claims 10, 13 -15, 17, 18, and 25 above, and further in view of either one of Uetake et al. (U.S. 5,377,245) or Panson et al. (U.S. 4,842,812). Either one of Hettiarachchi et al. or Kim et al. disclose the applicant's claims except for controlling the iron concentration by a purifier and demineralizer.

Either one of Uetake et al. or Panson et al. teach for mitigating the radiation exposure of personnel by reducing the amount of iron "crud" in the reactor water. Either one of these references disclose the use of a clean-up device (e.g. a filter) and demineralizer to remove said crud contained in the condensed water (e.g. see Fig. 1 and column 6, lines 35+ of Uetake et al., or Fig. 1 and column 5, 2nd paragraph of Panson et al.). One having ordinary skill in the art would have recognized the advantages of crud reduction, in addition to stress corrosion mitigation, as part of

nuclear power plant operation, and the addition of such crud reduction process would have been prima facie obvious.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method, as disclosed by either one of Hettiarachchi et al. or Kim et al., by the teaching of either one of Uetake et al. or Panson et al., to include an iron crud reduction process by a purifier and demineralizer in the condensing system of a reactor, to gain the advantages thereof (i.e., to further reduce of personnel radiation exposure), because such modification is no more than the use of conventional techniques within the nuclear art.

7. Claims 12, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Andresen-1 or Andresen-2, as applied to claims 10, 13, 14, 15, 18, and 25 above, and further in view of either one of Uetake et al. (U.S. 5,377,245) or Panson et al. (U.S. 4,842,812). Either one of Andresen-1 or Andresen-2 disclose the applicant's claims except for controlling the iron concentration by a purifier and demineralizer.

Either one of Uetake et al. or Panson et al. teach for mitigating the radiation exposure of personnel by reducing the amount of iron "crud" in the reactor water. Either one of these references disclose the use of a clean-up device (e.g. a filter) and demineralizer to remove said crud contained in the condensed water (e.g. see Fig. 1 and column 6, lines 35+ of Uetake et al., or Fig. 1 and column 5, 2nd paragraph of Panson et al.). One having ordinary skill in the art would have recognized the

advantages of crud reduction, in addition to stress corrosion mitigation, as part of nuclear power plant operation, and the addition of such crud reduction process would have been prima facie obvious.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method, as disclosed by either one of Andresen-1 or Andresen-2, by the teaching of either one of Uetake et al. or Panson et al., to include an iron crud reduction process by a purifier and demineralizer in the condensing system of a reactor, to gain the advantages thereof (i.e., to further reduce of personnel radiation exposure), because such modification is no more than the use of conventional techniques within the nuclear art.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References F and G further illustrate prior art..

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 3641


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 703-306-5756. The examiner can normally be reached on 8:00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone can be reached on 703-306-4198. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-0285 for regular communications and 703-305-0285 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist, telephone number is 703-308-1113.

RJP
July 5, 2002


MICHAEL J. CARONE
SUPERVISORY PATENT EXAMINER